

SEQUENCE LISTING

<110> Apicella, M. A.
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 Gibson, B. W.
 Scheffler, K.
 Brown, E.

<120> Vaccine and compositions for the
 prevention and treatment of Neisserial infections

<130> 875.045US1

<150> US 60/344,452

<151> 2001-10-23

<150> US 60/310,356

<151> 2001-08-06

<150> US 60/266,070

<151> 2001-01-31

<160> 12

<210> 1

<211> 2015

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1

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		20						25					30		
Ala	Gly	Ser	Ser	Val	Ser	Val	Ser	Leu	Lys	Thr	Ser	Gly	Asp	Leu	Cys
		35					40					45			
Gly	Lys	Leu	Lys	Thr	Thr	Leu	Lys	Thr	Leu	Val	Cys	Ser	Leu	Val	Ser
	50					55					60				
Leu	Ser	Met	Val	Leu	Pro	Ala	His	Ala	Gln	Ile	Thr	Thr	Asp	Lys	Ser
65				70					75					80	
Ala	Pro	Lys	Asn	Gln	Gln	Val	Val	Ile	Leu	Lys	Thr	Asn	Thr	Gly	Ala
			85						90					95	
Pro	Leu	Val	Asn	Ile	Gln	Thr	Pro	Asn	Gly	Arg	Gly	Leu	Ser	His	Asn
			100					105					110		
Arg	Tyr	Thr	Gln	Phe	Asp	Val	Asp	Asn	Lys	Gly	Ala	Val	Leu	Asn	Asn
		115					120					125			
Asp	Arg	Asn	Asn	Asn	Pro	Phe	Leu	Val	Lys	Gly	Ser	Ala	Gln	Leu	Ile
	130					135					140				
Leu	Asn	Glu	Val	Arg	Gly	Thr	Ala	Ser	Lys	Leu	Asn	Gly	Ile	Val	Thr
145				150					155					160	
Val	Gly	Gly	Gln	Lys	Ala	Asp	Val	Ile	Ile	Ala	Asn	Pro	Asn	Gly	Ile
			165						170					175	
Thr	Val	Asn	Gly	Gly	Gly	Phe	Lys	Asn	Val	Gly	Arg	Gly	Ile	Leu	Thr
		180						185					190		
Ile	Gly	Ala	Pro	Gln	Ile	Gly	Lys	Asp	Gly	Ala	Leu	Thr	Gly	Phe	Asp
	195						200						205		
Val	Arg	Gln	Gly	Thr	Leu	Thr	Val	Gly	Ala	Ala	Gly	Trp	Asn	Asp	Lys
	210					215						220			

Gly	Gly	Ala	Asp	Tyr	Thr	Gly	Val	Leu	Ala	Arg	Ala	Val	Ala	Leu	Gln	225	230	235	240
Gly	Lys	Leu	Gln	Gly	Lys	Asn	Leu	Ala	Val	Ser	Thr	Gly	Pro	Gln	Lys	245	250	255	
Val	Asp	Tyr	Ala	Ser	Gly	Glu	Ile	Ser	Ala	Gly	Thr	Ala	Ala	Gly	Thr	260	265	270	
Lys	Pro	Thr	Ile	Ala	Leu	Asp	Thr	Ala	Ala	Leu	Gly	Gly	Met	Tyr	Ala	275	280	285	
Asp	Ser	Ile	Thr	Leu	Ile	Ala	Asn	Glu	Lys	Gly	Val	Gly	Val	Lys	Asn	290	295	300	
Ala	Gly	Thr	Leu	Glu	Ala	Ala	Lys	Gln	Leu	Ile	Val	Thr	Ser	Ser	Gly	305	310	315	320
Arg	Ile	Glu	Asn	Ser	Gly	Arg	Ile	Ala	Thr	Thr	Ala	Asp	Gly	Thr	Glu	325	330	335	
Ala	Ser	Pro	Thr	Tyr	Leu	Ser	Ile	Glu	Thr	Thr	Glu	Lys	Gly	Ala	Ala	340	345	350	
Gly	Thr	Phe	Ile	Ser	Asn	Gly	Gly	Arg	Ile	Glu	Ser	Lys	Gly	Leu	Leu	355	360	365	
Val	Ile	Glu	Thr	Gly	Glu	Asp	Ile	Ser	Leu	Arg	Asn	Gly	Ala	Val	Val	370	375	380	
Gln	Asn	Asn	Gly	Ser	Arg	Pro	Ala	Thr	Thr	Val	Leu	Asn	Ala	Gly	His	385	390	395	400
Asn	Leu	Val	Ile	Glu	Ser	Lys	Thr	Asn	Val	Asn	Asn	Ala	Lys	Gly	Ser	405	410	415	
Ala	Asn	Leu	Ser	Ala	Gly	Gly	Arg	Thr	Thr	Ile	Asn	Asp	Ala	Thr	Ile	420	425	430	
Gln	Ala	Gly	Ser	Ser	Val	Tyr	Ser	Ser	Thr	Lys	Gly	Asp	Thr	Glu	Leu	435	440	445	
Gly	Glu	Asn	Thr	Arg	Ile	Ile	Ala	Glu	Asn	Val	Thr	Val	Leu	Ser	Asn	450	455	460	
Gly	Ser	Ile	Gly	Ser	Ala	Ala	Val	Ile	Glu	Ala	Lys	Asp	Thr	Ala	His	465	470	475	480
Ile	Glu	Ser	Gly	Lys	Pro	Leu	Ser	Leu	Glu	Thr	Ser	Thr	Val	Ala	Ser	485	490	495	
Asn	Ile	Arg	Leu	Asn	Asn	Gly	Asn	Ile	Lys	Gly	Gly	Lys	Gln	Leu	Ala	500	505	510	
Leu	Leu	Ala	Asp	Asp	Asn	Ile	Thr	Ala	Lys	Thr	Thr	Asn	Leu	Asn	Thr	515	520	525	
Pro	Gly	Asn	Leu	Tyr	Val	His	Thr	Gly	Lys	Asp	Leu	Asn	Leu	Asn	Val	530	535	540	
Asp	Lys	Asp	Leu	Ser	Ala	Ala	Ser	Ile	His	Leu	Lys	Ser	Asp	Asn	Ala	545	550	555	560
Ala	His	Ile	Thr	Gly	Thr	Ser	Lys	Thr	Leu	Thr	Ala	Ser	Lys	Asp	Met	565	570	575	
Gly	Val	Glu	Ala	Gly	Leu	Leu	Asn	Val	Thr	Asn	Thr	Asn	Leu	Arg	Thr	580	585	590	
Asn	Ser	Gly	Asn	Leu	His	Ile	Gln	Ala	Ala	Lys	Gly	Asn	Ile	Gln	Leu	595	600	605	
Arg	Asn	Thr	Lys	Leu	Asn	Ala	Ala	Lys	Ala	Leu	Glu	Thr	Thr	Ala	Leu	610	615	620	
Gln	Gly	Asn	Ile	Val	Ser	Asp	Gly	Leu	His	Ala	Val	Ser	Ala	Asp	Gly	625	630	635	640
His	Val	Ser	Leu	Leu	Ala	Asn	Gly	Asn	Ala	Asp	Phe	Thr	Gly	His	Asn	645	650	655	
Thr	Leu	Thr	Ala	Lys	Ala	Asp	Val	Asn	Ala	Gly	Ser	Val	Gly	Lys	Gly	660	665	670	
Arg	Leu	Lys	Ala	Asp	Asn	Thr	Asn	Ile	Thr	Ser	Ser	Ser	Gly	Asp	Ile	675	680	685	

Thr	Leu	Val	Ala	Gly	Asn	Gly	Ile	Gln	Leu	Gly	Asp	Gly	Lys	Gln	Arg	690	695	700
Asn	Ser	Ile	Asn	Gly	Lys	His	Ile	Ser	Ile	Lys	Asn	Asn	Gly	Gly	Asn	705	710	715
Ala	Asp	Leu	Lys	Asn	Leu	Asn	Val	His	Ala	Lys	Ser	Gly	Ala	Leu	Asn	725	730	735
Ile	His	Ser	Asp	Arg	Ala	Leu	Ser	Ile	Glu	Asn	Thr	Lys	Leu	Glu	Ser	740	745	750
Thr	His	Asn	Thr	His	Leu	Asn	Ala	Gln	His	Glu	Arg	Val	Thr	Leu	Asn	755	760	765
Gln	Val	Asp	Ala	Tyr	Ala	His	Arg	His	Leu	Ser	Ile	Thr	Gly	Ser	Gln	770	775	780
Ile	Trp	Gln	Asn	Asp	Lys	Leu	Pro	Ser	Ala	Asn	Lys	Leu	Val	Ala	Asn	785	790	795
Gly	Val	Leu	Ala	Leu	Asn	Ala	Arg	Tyr	Ser	Gln	Ile	Ala	Asp	Asn	Thr	805	810	815
Thr	Leu	Arg	Ala	Gly	Ala	Ile	Asn	Leu	Thr	Ala	Gly	Thr	Ala	Leu	Val	820	825	830
Lys	Arg	Gly	Asn	Ile	Asn	Trp	Ser	Thr	Val	Ser	Thr	Lys	Thr	Leu	Glu	835	840	845
Asp	Asn	Ala	Glu	Leu	Lys	Pro	Leu	Ala	Gly	Arg	Leu	Asn	Ile	Glu	Ala	850	855	860
Gly	Ser	Gly	Thr	Leu	Thr	Ile	Glu	Pro	Ala	Asn	Arg	Ile	Ser	Ala	His	865	870	875
Thr	Asp	Leu	Ser	Ile	Lys	Thr	Gly	Gly	Lys	Leu	Leu	Leu	Ser	Ala	Lys	885	890	895
Gly	Gly	Asn	Ala	Gly	Ala	Pro	Ser	Ala	Gln	Val	Ser	Ser	Leu	Glu	Ala	900	905	910
Lys	Gly	Asn	Ile	Arg	Leu	Val	Thr	Gly	Glu	Thr	Asp	Leu	Arg	Gly	Ser	915	920	925
Lys	Ile	Thr	Ala	Gly	Lys	Asn	Leu	Val	Val	Ala	Thr	Thr	Lys	Gly	Lys	930	935	940
Leu	Asn	Ile	Glu	Ala	Val	Asn	Asn	Ser	Phe	Ser	Asn	Tyr	Phe	Pro	Thr	945	950	955
Gln	Lys	Ala	Ala	Glu	Leu	Asn	Gln	Lys	Ser	Lys	Glu	Leu	Glu	Gln	Gln	965	970	975
Ile	Ala	Gln	Leu	Lys	Lys	Ser	Ser	Pro	Lys	Ser	Lys	Leu	Ile	Pro	Thr	980	985	990
Leu	Gln	Glu	Glu	Arg	Asp	Arg	Leu	Ala	Phe	Tyr	Ile	Gln	Ala	Ile	Asn	995	1000	1005
Lys	Glu	Val	Lys	Gly	Lys	Lys	Pro	Lys	Gly	Lys	Glu	Tyr	Leu	Gln	Ala	1010	1015	1020
Lys	Leu	Ser	Ala	Gln	Asn	Ile	Asp	Leu	Ile	Ser	Ala	Gln	Gly	Ile	Glu	1025	1030	1035
Ile	Ser	Gly	Ser	Asp	Ile	Thr	Ala	Ser	Lys	Lys	Leu	Asn	Leu	His	Ala	1045	1050	1055
Ala	Gly	Val	Leu	Pro	Lys	Ala	Ala	Asp	Ser	Glu	Ala	Ala	Ala	Ile	Leu	1060	1065	1070
Ile	Asp	Gly	Ile	Thr	Asp	Gln	Tyr	Glu	Ile	Gly	Lys	Pro	Thr	Tyr	Lys	1075	1080	1085
Ser	His	Tyr	Asp	Lys	Ala	Ala	Leu	Asn	Lys	Pro	Ser	Arg	Leu	Thr	Gly	1090	1095	1100
Arg	Thr	Gly	Val	Ser	Ile	His	Ala	Ala	Ala	Ala	Leu	Asp	Asp	Ala	Arg	1105	1110	1115
Ile	Ile	Ile	Gly	Ala	Ser	Glu	Ile	Lys	Ala	Pro	Ser	Gly	Ser	Ile	Asp	1125	1130	1135
Ile	Lys	Ala	His	Ser	Asp	Ile	Val	Leu	Glu	Ala	Gly	Gln	Asn	Asp	Ala	1140	1145	1150

Tyr Thr Phe Leu Lys Thr Lys Gly Lys Ser Gly Lys Ile Ile Arg Lys
 1155 1160 1165
 Thr Lys Phe Thr Ser Thr Arg Asp His Leu Ile Met Pro Ala Pro Val
 1170 1175 1180
 Glu Leu Thr Ala Asn Gly Ile Thr Leu Gln Ala Gly Gly Asn Ile Glu
 1185 1190 1195 1200
 Ala Asn Thr Thr Arg Phe Asn Ala Pro Ala Gly Lys Val Thr Leu Val
 1205 1210 1215
 Ala Gly Glu Glu Leu Gln Leu Leu Ala Glu Glu Gly Ile His Lys His
 1220 1225 1230
 Glu Leu Asp Val Gln Lys Ser Arg Arg Phe Ile Gly Ile Lys Val Gly
 1235 1240 1245
 Lys Ser Asn Tyr Ser Lys Asn Glu Leu Asn Glu Thr Lys Leu Pro Val
 1250 1255 1260
 Arg Val Val Ala Gln Thr Ala Ala Thr Arg Ser Gly Trp Asp Thr Val
 1265 1270 1275 1280
 Leu Glu Gly Thr Glu Phe Lys Thr Thr Leu Ala Gly Ala Asp Ile Gln
 1285 1290 1295
 Ala Gly Val Gly Glu Lys Ala Arg Val Asp Ala Lys Ile Ile Leu Lys
 1300 1305 1310
 Gly Ile Val Asn Arg Ile Gln Ser Glu Glu Lys Leu Glu Thr Asn Ser
 1315 1320 1325
 Thr Val Trp Gln Lys Gln Ala Gly Arg Gly Ser Thr Ile Glu Thr Leu
 1330 1335 1340
 Lys Leu Pro Ser Phe Glu Ser Pro Thr Pro Pro Lys Leu Ser Ala Pro
 1345 1350 1355 1360
 Gly Gly Tyr Ile Val Asp Ile Pro Lys Gly Asn Leu Lys Thr Glu Ile
 1365 1370 1375
 Glu Lys Leu Ser Lys Gln Pro Glu Tyr Ala Tyr Leu Lys Gln Leu Gln
 1380 1385 1390
 Val Ala Lys Asn Ile Asn Trp Asn Gln Val Gln Leu Ala Tyr Asp Arg
 1395 1400 1405
 Trp Asp Tyr Lys Gln Glu Gly Leu Thr Glu Ala Gly Ala Ala Ile Ile
 1410 1415 1420
 Ala Leu Ala Val Thr Val Thr Ser Gly Ala Gly Thr Gly Ala Val
 1425 1430 1435 1440
 Leu Gly Leu Asn Gly Ala Ala Ala Ala Ala Thr Asp Ala Ala Phe Ala
 1445 1450 1455
 Ser Leu Ala Ser Gln Ala Ser Val Ser Phe Ile Asn Asn Lys Gly Asp
 1460 1465 1470
 Val Gly Lys Thr Leu Lys Glu Leu Gly Arg Ser Ser Thr Val Lys Asn
 1475 1480 1485
 Leu Val Val Ala Ala Ala Thr Ala Gly Val Ala Asp Lys Ile Gly Ala
 1490 1495 1500
 Ser Ala Leu Asn Asn Val Ser Asp Lys Gln Trp Ile Asn Asn Leu Thr
 1505 1510 1515 1520
 Val Asn Leu Ala Asn Ala Gly Ser Ala Ala Leu Ile Asn Thr Ala Ile
 1525 1530 1535
 Asn Gly Gly Ser Leu Lys Asp Asn Leu Gly Asp Ala Ala Leu Gly Ala
 1540 1545 1550
 Ile Val Ser Thr Val His Gly Glu Val Ala Ser Lys Ile Lys Phe Asn
 1555 1560 1565
 Leu Ser Glu Asp Tyr Ile Thr His Lys Ile Ala His Ala Ile Ala Gly
 1570 1575 1580
 Cys Ala Ala Ala Ala Asn Lys Gly Lys Cys Gln Asp Gly Ala Ile
 1585 1590 1595 1600
 Gly Ala Ala Val Gly Glu Ile Val Gly Glu Ala Leu Thr Asn Gly Lys
 1605 1610 1615

Asn	Pro	Ala	Thr	Leu	Thr	Ala	Lys	Glu	Arg	Glu	Gln	Ile	Leu	Ala	Tyr	1620	1625	1630
Ser	Lys	Leu	Val	Ala	Gly	Thr	Val	Ser	Gly	Val	Val	Gly	Gly	Asp	Val	1635	1640	1645
Asn	Thr	Ala	Ala	Asn	Ala	Ala	Lys	Val	Ala	Ile	Glu	Asn	Asn	Leu	Leu	1650	1655	1660
Ser	Gln	Glu	Glu	Tyr	Ala	Leu	Arg	Glu	Lys	Leu	Ile	Lys	Lys	Ala	Lys	1665	1670	1675
Gly	Lys	Gly	Leu	Leu	Ser	Leu	Asp	Trp	Gly	Ser	Leu	Thr	Glu	Gln	Glu	1685	1690	1695
Ala	Arg	Gln	Phe	Ile	Tyr	Leu	Ile	Glu	Lys	Asp	Arg	Tyr	Ser	Asn	Gln	1700	1705	1710
Leu	Leu	Asp	Arg	Tyr	Gln	Lys	Asn	Pro	Ser	Ser	Leu	Asn	Asn	Gln	Glu	1715	1720	1725
Lys	Asn	Ile	Leu	Ala	Tyr	Phe	Ile	Asn	Gln	Thr	Ser	Gly	Gly	Asn	Thr	1730	1735	1740
Ala	Trp	Ala	Ala	Ser	Ile	Leu	Lys	Thr	Pro	Gln	Ser	Met	Gly	Asn	Leu	1745	1750	1755
Thr	Ile	Pro	Ser	Lys	Asp	Ile	Asn	Asn	Thr	Leu	Ser	Lys	Ala	Tyr	Gln	1765	1770	1775
Thr	Leu	Ser	Arg	Tyr	Asp	Ser	Phe	Asp	Tyr	Lys	Ser	Ala	Val	Ala	Ala	1780	1785	1790
Gln	Pro	Ala	Leu	Tyr	Leu	Leu	Asn	Gly	Pro	Leu	Gly	Phe	Ser	Val	Lys	1795	1800	1805
Ala	Ala	Thr	Val	Ala	Ala	Gly	Gly	Tyr	Asn	Ile	Gly	Gln	Gly	Ala	Lys	1810	1815	1820
Ala	Ile	Ser	Asn	Gly	Glu	Tyr	Leu	His	Gly	Thr	Val	Gln	Val	Val	Asn	1825	1830	1835
Gly	Thr	Leu	Met	Val	Ala	Gly	Ser	Val	Ser	Ala	Gln	Ala	Ala	Ile	Ser	1845	1850	1855
Ala	Lys	Pro	Ala	Pro	Val	Thr	Arg	Tyr	Leu	Ser	Asn	Asp	Ser	Ala	Pro	1860	1865	1870
Ala	Leu	Arg	Gln	Ala	Leu	Thr	Ala	Glu	Ser	Gln	Arg	Ile	Arg	Met	Lys	1875	1880	1885
Leu	Pro	Glu	Glu	Tyr	Arg	Gln	Ile	Gly	Asn	Leu	Ala	Ile	Ala	Lys	Ile	1890	1895	1900
Asp	Val	Lys	Gly	Leu	Pro	Gln	Arg	Met	Glu	Ala	Phe	Ser	Ser	Phe	Gln	1905	1910	1915
Lys	Gly	Glu	His	Gly	Phe	Ile	Ser	Leu	Pro	Glu	Thr	Lys	Ile	Phe	Lys	1925	1930	1935
Pro	Ile	Ser	Val	Asp	Lys	Tyr	His	Asn	Ile	Ala	Ser	Pro	Pro	Arg	Gly	1940	1945	1950
Thr	Leu	Arg	Asn	Ile	Asp	Gly	Glu	Tyr	Lys	Leu	Leu	Glu	Thr	Ile	Ala	1955	1960	1965
Gln	Gln	Leu	Gly	Asn	Asn	Arg	Asn	Val	Ser	Gly	Arg	Ile	Asp	Leu	Phe	1970	1975	1980
Thr	Glu	Leu	Lys	Ala	Cys	Gln	Ser	Cys	Ser	Asn	Val	Ile	Leu	Glu	Phe	1985	1990	1995
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 <212> PRT
 <213> Neisseria gonorrhoeae

<400> 2

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		20					25					30			
Thr	Glu	Gln	Ser	Val	Gly	Leu	Glu	Thr	Val	Ser	Val	Val	Gly	Lys	Ser
		35				40					45				
Arg	Pro	Arg	Ala	Thr	Ser	Gly	Leu	Leu	His	Thr	Ser	Thr	Ala	Ser	Asp
	50				55					60					
Lys	Ile	Ile	Ser	Gly	Asp	Thr	Leu	Arg	Gln	Lys	Ala	Val	Asn	Leu	Gly
65				70					75					80	
Asp	Ala	Leu	Asp	Gly	Val	Pro	Gly	Ile	His	Ala	Ser	Gln	Tyr	Gly	Gly
			85					90						95	
Gly	Ala	Ser	Ala	Pro	Val	Ile	Arg	Gly	Gln	Thr	Gly	Arg	Arg	Ile	Lys
		100					105					110			
Val	Leu	Asn	His	His	Gly	Glu	Thr	Gly	Asp	Met	Ala	Asp	Phe	Ser	Pro
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Asp	His	Ala	Ile	Met	Val	Asp	Ser	Ala	Leu	Ser	Gln	Gln	Val	Glu	Ile
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Leu	Arg	Gly	Pro	Val	Thr	Leu	Leu	Tyr	Ser	Ser	Gly	Asn	Val	Ala	Gly
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Leu	Val	Asp	Val	Ala	Asp	Gly	Lys	Ile	Pro	Glu	Lys	Met	Pro	Glu	Asn
			165					170						175	
Gly	Val	Ser	Gly	Glu	Leu	Gly	Leu	Arg	Leu	Ser	Ser	Gly	Asn	Leu	Glu
		180					185						190		
Lys	Leu	Thr	Ser	Gly	Gly	Ile	Asn	Ile	Gly	Leu	Gly	Lys	Asn	Phe	Val
		195					200					205			
Leu	His	Thr	Glu	Gly	Leu	Tyr	Arg	Lys	Ser	Gly	Asp	Tyr	Ala	Val	Pro
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Arg	Tyr	Arg	Asn	Leu	Lys	Arg	Leu	Pro	Asp	Ser	His	Ala	Asp	Ser	Gln
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Thr	Gly	Ser	Ile	Gly	Leu	Ser	Trp	Val	Gly	Glu	Lys	Gly	Phe	Ile	Gly
			245					250						255	
Ala	Ala	Tyr	Ser	Asp	Arg	Arg	Asp	Gln	Tyr	Gly	Leu	Pro	Ala	His	Ser
		260					265					270			
His	Glu	Tyr	Asp	Asp	Cys	His	Ala	Asp	Ile	Ile	Trp	Gln	Lys	Ser	Leu
		275					280					285			
Ile	Asn	Lys	Arg	Tyr	Leu	Gln	Leu	Tyr	Pro	His	Leu	Leu	Thr	Glu	Glu
	290					295					300				
Asp	Ile	Asp	Tyr	Asp	Asn	Pro	Gly	Leu	Ser	Cys	Gly	Phe	His	Asp	Asp
305				310					315					320	
Asp	Asp	Ala	His	Ala	His	Ala	His	Asn	Gly	Lys	Pro	Trp	Ile	Asp	Leu
			325					330						335	
Arg	Asn	Lys	Arg	Tyr	Glu	Leu	Arg	Ala	Glu	Trp	Lys	Gln	Pro	Phe	Pro
		340					345					350			
Gly	Phe	Glu	Ala	Leu	Arg	Val	His	Leu	Asn	Arg	Asn	Asp	Tyr	Arg	His
		355				360					365				
Asp	Glu	Lys	Ala	Gly	Asp	Ala	Val	Glu	Asn	Phe	Phe	Asn	Asn	Gln	Thr
	370					375					380				
Gln	Asn	Ala	Arg	Ile	Glu	Leu	Arg	His	Gln	Pro	Ile	Gly	Arg	Leu	Lys
385				390					395					400	
Gly	Ser	Trp	Gly	Val	Gln	Tyr	Leu	Gly	Gln	Lys	Ser	Ser	Ala	Leu	Ser
			405					410						415	
Ala	Thr	Ser	Glu	Ala	Val	Lys	Gln	Pro	Met	Leu	Leu	Asp	Asn	Lys	Val
		420					425					430			
Gln	His	Tyr	Ser	Phe	Phe	Gly	Val	Glu	Gln	Ala	Asn	Trp	Asp	Asn	Phe
		435				440					445				
Thr	Leu	Glu	Gly	Gly	Val	Arg	Val	Glu	Lys	Gln	Lys	Ala	Ser	Ile	Arg
	450					455					460				

Tyr	Asp	Lys	Ala	Leu	Ile	Asp	Arg	Glu	Asn	Tyr	Tyr	Asn	His	Pro	Leu
465					470					475					480
Pro	Asp	Leu	Gly	Ala	His	Arg	Gln	Thr	Ala	Arg	Ser	Phe	Ala	Leu	Ser
				485					490						495
Gly	Asn	Trp	Tyr	Phe	Thr	Pro	Gln	His	Lys	Leu	Ser	Leu	Thr	Ala	Ser
		500						505					510		
His	Gln	Glu	Arg	Leu	Pro	Ser	Thr	Gln	Glu	Leu	Tyr	Ala	His	Gly	Lys
		515					520					525			
His	Val	Ala	Thr	Asn	Thr	Phe	Glu	Val	Gly	Asn	Lys	His	Leu	Asn	Lys
		530				535					540				
Glu	Arg	Ser	Asn	Asn	Ile	Glu	Leu	Ala	Leu	Gly	Tyr	Glu	Gly	Asp	Arg
545				550						555					560
Trp	Gln	Tyr	Asn	Leu	Ala	Leu	Tyr	Arg	Asn	Arg	Phe	Gly	Asn	Tyr	Ile
			565						570						575
Tyr	Ala	Gln	Thr	Leu	Asn	Asp	Gly	Arg	Gly	Pro	Lys	Ser	Ile	Glu	Asp
			580					585						590	
Asp	Ser	Glu	Met	Lys	Leu	Val	Arg	Tyr	Asn	Gln	Ser	Gly	Ala	Asp	Phe
		595					600					605			
Tyr	Gly	Ala	Glu	Gly	Glu	Ile	Tyr	Phe	Lys	Pro	Thr	Pro	Arg	Tyr	Arg
	610					615					620				
Ile	Gly	Val	Ser	Gly	Asp	Tyr	Val	Arg	Gly	Arg	Leu	Lys	Asn	Leu	Pro
625					630					635					640
Ser	Leu	Pro	Gly	Arg	Glu	Asp	Ala	Tyr	Gly	Asn	Arg	Pro	Leu	Ile	Ala
				645						650					655
Gln	Ala	Asp	Gln	Asn	Ala	Pro	Arg	Val	Pro	Ala	Ala	Arg	Leu	Gly	Val
			660					665						670	
His	Leu	Lys	Ala	Ser	Leu	Thr	Asp	Arg	Ile	Asp	Ala	Asn	Leu	Asp	Tyr
		675					680					685			
Tyr	Arg	Val	Phe	Ala	Gln	Asn	Lys	Leu	Ala	Arg	Tyr	Glu	Thr	Arg	Thr
	690					695					700				
Pro	Gly	His	His	Met	Leu	Asn	Leu	Gly	Ala	Asn	Tyr	Arg	Arg	Asn	Thr
705				710						715					720
Arg	Tyr	Gly	Glu	Trp	Asn	Trp	Tyr	Val	Lys	Ala	Asp	Asn	Leu	Leu	Asn
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Gln	Ser	Val	Tyr	Ala	His	Ser	Ser	Phe	Leu	Ser	Asp	Thr	Pro	Gln	Met
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<211> 720

<212> PRT

<213> Neisseria gonorrhoeae

<400> 3

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Glu	Leu	Leu	Lys	Glu	Glu	Pro	Ser	Ile	Asp	Phe	Gly	Gly	Gly	Asn	Gly
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Thr	Ser	Gln	Phe	Leu	Thr	Leu	Arg	Gly	Met	Gly	Gln	Asn	Ser	Val	Asp
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Ile	Lys	Val	Asp	Asn	Ala	Tyr	Ser	Asp	Ser	Gln	Ile	Leu	Tyr	His	Gln	
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Gly	Arg	Phe	Ile	Val	Asp	Pro	Ala	Leu	Val	Lys	Val	Val	Ser	Val	Gln	
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Ile	Ile	Ala	Lys	Thr	Val	Asp	Ala	Gln	Asp	Leu	Leu	Lys	Gly	Leu	Asp	
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Lys	Asn	Trp	Gly	Val	Arg	Leu	Asn	Ser	Gly	Phe	Ala	Ser	Asn	Glu	Gly	
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Val	Ser	Tyr	Gly	Ala	Ser	Val	Phe	Gly	Lys	Glu	Gly	Asn	Phe	Asp	Gly	
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	210				215						220					
Asp	Lys	Arg	Ser	Tyr	Leu	Ala	Lys	Ile	Gly	Thr	Thr	Phe	Gly	Asp	Asp	
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<211> 525

<212> PRT

<213> Neisseria gonorrhoeae

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Ser	Cys	Ser	Ser	Trp	Leu	Pro	Pro	Leu	Glu	Glu	Arg	Thr	Glu	Ser	Arg
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Arg	Val	Arg	Leu	Leu	Leu	Asp	Asp	Asn	Asn	Thr	Arg	Gly	Leu	Asp	Asp
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Leu	Leu	Leu	Ala	Leu	Asp	Ser	His	Pro	Asn	Ile	Glu	Val	Arg	Leu	Phe
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Phe	Pro	Arg	Leu	Asn	Arg	Arg	Met	His	Asn	Lys	Ser	Phe	Thr	Ala	Asp
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Lys	Val	Gly	Glu	Asp	Thr	Val	Phe	Ala	Asp	Leu	Asp	Ile	Leu	Ala	Thr
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Gly	Ser	Val	Val	Gly	Glu	Val	Ser	His	Asp	Phe	Asp	Arg	Tyr	Trp	Ala
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 Gly Lys Gly Leu Gln Ala Leu Gly Tyr Asn Asp Glu Thr Ser Arg His
 260 265 270
 Ala Leu Leu Arg Tyr Arg Glu Thr Val Glu Gln Ser Pro Leu Tyr Gln
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 Lys Ile Gln Thr Gly Arg Ile Asp Trp Gln Ser Val Gln Thr Arg Leu
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 Ile Ser Asp Asp Pro Ala Lys Gly Leu Asp Arg Asp Arg Arg Lys Pro
 305 310 315 320
 Pro Ile Ala Gly Arg Leu Gln Asp Ala Leu Lys Gln Pro Glu Lys Ser
 325 330 335
 Val Tyr Leu Val Ser Pro Tyr Phe Val Pro Thr Lys Ser Gly Thr Asp
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 Ala Leu Ala Lys Leu Val Gln Asp Gly Ile Asp Val Thr Val Leu Thr
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 Asn Ser Leu Gln Ala Thr Asp Val Ala Ala Val His Ser Gly Tyr Val
 370 375 380
 Lys Tyr Arg Lys Pro Leu Lys Ala Gly Ile Lys Leu Tyr Glu Leu
 385 390 395 400
 Gln Pro Asn His Ala Val Pro Ala Thr Lys Asp Lys Gly Leu Thr Gly
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 465 470 475 480
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<211> 330

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<213> Neisseria gonorrhoeae

<400> 5

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 35 40 45
 Thr Ala Ser Leu Asn Lys His Thr Cys Arg Ser Tyr Arg Gly Ser Phe
 50 55 60
 Leu Ser Leu Glu Lys Ile Gly Leu Leu Ser Leu Asp Met Asn Leu Gln
 65 70 75 80
 Glu Phe Ser Leu Leu Asn His Asn Leu Ile Leu Asp Ala Ile Lys Lys
 85 90 95
 Val Ser Ser Ala Lys Thr Ser Trp Thr Glu Gly Thr Lys Gln Val Arg
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Ala Ala Ser Tyr Ile Ser Leu Thr Arg Phe Leu Asn Arg Met Thr Gln
115 120 125
Gly Ile Val Ala Ile Ala Gln Pro Ser Lys Gln Glu Asn Ser Arg Thr
130 135 140
Phe Phe Lys Thr Arg Glu Ile Val Lys Thr Asp Ala Met Asn Ser Leu
145 150 155 160
Gln Thr Ala Ser Phe Leu Lys Glu Leu Lys Lys Ile Asn Ala Arg Asp
165 170 175
Trp Leu Ile Ala Gln Thr Met Leu Gln Gly Gly Lys Arg Ser Ser Glu
180 185 190
Val Leu Ser Leu Glu Ile Ser Gln Ile Cys Phe Gln Gln Ala Thr Ile
195 200 205
Ser Phe Ser Gln Leu Lys Asn Arg Gln Thr Glu Lys Arg Ile Ile Ile
210 215 220
Thr Tyr Pro Gln Lys Phe Met His Phe Leu Gln Glu Tyr Ile Gly Gln
225 230 235 240
Arg Arg Gly Phe Val Phe Val Thr Arg Ser Gly Lys Met Val Gly Leu
245 250 255
Arg Gln Ile Ala Arg Thr Phe Ser Gln Ala Gly Leu Gln Ala Ala Ile
260 265 270
Pro Phe Lys Ile Thr Pro His Val Leu Arg Ala Thr Ala Val Thr Glu
275 280 285
Tyr Lys Arg Leu Gly Cys Ser Asp Ser Asp Ile Met Lys Val Thr Gly
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<211> 6048

<212> DNA

<213> Neisseria gonorrhoeae

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<211> 2295

<212> DNA

<213> Neisseria gonorrhoeae

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<211> 2307

<212> DNA

<213> Neisseria gonorrhoeae

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 Val Met Glu Gln Phe Lys Lys Ser Lys Thr Leu Phe Ser Leu Met Gln
 35 40 45
 Tyr Ser Asp Glu Phe Arg Ile His Phe Thr Phe Asn Asp Phe Lys Arg
 50 55 60
 Asn Pro Ser Pro Arg Ser His Val Ser Pro Ile Lys Gln Leu Asn Gly
 65 70 75 80
 Arg Thr Lys Thr Ala Ser Gly Ile Arg Lys Val Val Arg Glu Leu Phe
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 His Lys Thr Asn Gly Ala Arg Glu Asn Ala Ala Lys Ile Leu Val Val
 100 105 110
 Ile Thr Asp Gly Glu Lys Phe Gly Asp Pro Leu Asp Tyr Lys Asp Val
 115 120 125
 Ile Pro Glu Ala Asp Arg Ala Gly Val Ile Arg Tyr Val Ile Gly Val
 130 135 140
 Gly Asn Ala Phe Asn Lys Pro Gln Ser Arg Arg Glu Leu Asp Thr Ile
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 Ala Ser Lys Pro Ala Gly Glu His Val Phe Gln Val Asp Asn Phe Glu
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